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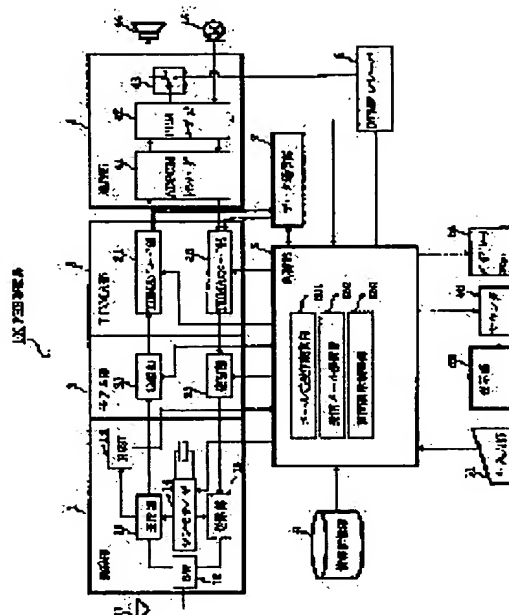
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(54) COMMUNICATION TERMINAL AND RECEIVED DATA DISPLAY CONTROL METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To improve the clearness of received data at the time of recognizing the display of received data and to prevent deterioration in reception recognition.

SOLUTION: In a PHS(personal handy phone system) mobile station 100, at least a picture display and a character display are installed on a display 52. A received data analysis part 502 analyzes mail data received by the control of a mail transmission/reception control 501 and discriminates/identifies character data and picture data. A screen display control 503 displays character data in received mail data on the character display and picture data on the picture display based on the analysis result of the received data analysis 502. Since characteristic data and picture data are simultaneously displayed on the display 52, a character message in a received mail and a picture (illuminations and the like) related to it can simultaneously be recognized.



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CLAIMS

[Claim(s)]

[Claim 1] The communication terminal characterized by providing the received-data analysis means which analyzes said received data and carries out judgment discernment of alphabetic data and the image data in the communication terminal which displays the data received with the data receiving means on a display means, and a display-control means to display said alphabetic data and said image data on coincidence to said display means based on the analysis result of said data analysis means.

[Claim 2] It is the communication terminal according to claim 1 which, as for a display means, the character representation section and the image display section are beforehand set up on the display screen, and is characterized by displaying said display-control means on the display which corresponds said alphabetic data and image data respectively.

[Claim 3] A display-control means is a communication terminal according to claim 2 characterized by switching to the display screen which displays only said alphabetic data to said character representation section and said image display section during the coincidence display of said alphabetic data and said image data based on predetermined character representation actuation.

[Claim 4] A display-control means is a communication terminal according to claim 2 or 3 characterized by switching said alphabetic data to the display screen which indicates by scrolling during the coincidence display of said alphabetic data and said image data based on predetermined scrolling display actuation.

[Claim 5] A received-data analysis means is a communication terminal according to claim 1 characterized by performing judgment discernment of said alphabetic data and said image data based on the data identifier contained in said received data.

[Claim 6] The communication terminal according to claim 1 characterized by providing a data transmitting means to generate the data which consist of the identifier corresponding to the contents of data of each of this data, and each data concerned based on alphabetic data and image data, and to transmit to it.

[Claim 7] The received-data display-control approach characterized by displaying said alphabetic data and said image data on coincidence to said display means based on said analysis result while carrying out judgment discernment of alphabetic data and the image data by analyzing said received data in the received-data display-control approach of the communication terminal which displays the data received with the data receiving means on a display means.

[Claim 8] A display means is the received-data display-control approach according to claim 7 characterized by setting up the character representation section and the image display section beforehand on a display screen, and displaying said alphabetic data and image data on the display which corresponds respectively.

[Claim 9] The received-data display-control approach according to claim 8 characterized by switching to the display screen which displays only said alphabetic data to said character representation section and said image display section during the coincidence display of alphabetic data and image data based on predetermined character representation actuation.

[Claim 10] The received-data display-control approach according to claim 8 or 9 characterized

by switching said alphabetic data to the display screen which indicates by scrolling during the coincidence display of alphabetic data and image data based on predetermined scrolling display actuation.

[Claim 11] The received-data display-control approach according to claim 7 characterized by performing judgment discernment of said alphabetic data and said image data based on the data identifier contained in received data.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to amelioration of the received-data display-control approach at the time of receiving in detail the data which consist of alphabetic data and image data with respect to the communication terminal which displays the received data on a display means and can check them.

[0002]

[Description of the Prior Art] For example, in communication terminals, such as a PHS (Personal Handyphone System) migration terminal, what has a mail data transceiver function is known. Moreover, about this mail data transceiver function, there is also a model which can respond to transmission and reception of the data with which alphabetic data and image data were intermingled as mail data.

[0003] When the mail data with which alphabetic data and image data are intermingled from a partner terminal is received, a screen is switched and the alphabetic data and the image data in this receiving mail data are expressed as this kind of conventional equipment, respectively.

[0004] For this reason, conventionally, with equipment, the user was not able to see an alphabetic character message and an image on the same screen, also when the contents of reception mail were checked. usually, although it usually appears as an image in an alphabetic character message to attach an illustration with close relation etc. in attaching and sending an image to an alphabetic character message, with equipment, the designation nature of reception mail will be spoiled conventionally which cannot display the alphabetic character message which has this relation, an illustration, etc. on the same screen.

[0005] Moreover, conventionally which can only perform displaying separately an alphabetic character message indicator screen and an image display screen, with equipment, in order to check the contents of this kind of the whole receiving mail data, it is necessary to switch an alphabetic character message indicator screen and an image display screen, and received-data display confirmation operation will make it complicated once [at least].

[0006]

[Problem(s) to be Solved by the Invention] Thus, conventionally [above-mentioned], with equipment, since displaying image data on a respectively different screen only did the alphabetic data in these received data when the data which consist of alphabetic data and image data were received, on the occasion of the check of received data, the user could not see an alphabetic character message and an image on the same screen, but had the trouble that the designation nature of received data was spoiled.

[0007] Furthermore, by the time it checked both the alphabetic character message in received data, and the image, there was a trouble of performing change-over actuation with an alphabetic character message indicator screen and an image display screen and that it was required and the operability for a received-data check fell, once [at least].

[0008] It aims at offering the communication terminal which this invention cancels the above-mentioned trouble, and raises the designation nature of the received data for the display check of received data, and can prevent the operability fall of confirmation-of-receipt actuation, and

the received-data display-control approach.

[0009]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, invention of claim 1 analyzes said received data, and is characterized by to provide the received-data analysis means which carries out judgment discernment of alphabetic data and the image data, and a display-control means display said alphabetic data and said image data on coincidence to said display means based on the analysis result of said data-analysis means in the communication terminal which displays the data received with the data receiving means on a display means.

[0010] In invention of claim 1, as for invention of claim 2, the character representation section and the image display section are beforehand set up on the display screen, as for a display means, and said display-control means is characterized by displaying said alphabetic data and image data on the display which corresponds respectively.

[0011] Invention of claim 3 is characterized by switching a display-control means to the display screen which displays only said alphabetic data to said character representation section and said image display section during the coincidence display of said alphabetic data and said image data based on predetermined character representation actuation in invention of claim 2.

[0012] Invention of claim 4 is characterized by a display-control means switching said alphabetic data to the display screen which indicates by scrolling during the coincidence display of said alphabetic data and said image data based on predetermined scrolling display actuation in invention of claims 2 or 3.

[0013] It is characterized by invention of claim 5 performing judgment discernment of said alphabetic data and said image data in invention of claim 1 based on the data identifier by which a received-data analysis means is included in said received data.

[0014] Invention of claim 6 is characterized by providing a data transmitting means to generate alphabetic data and the data which consist of the identifier corresponding to the contents of data of each of this data, and each data concerned based on image data, and to transmit in invention of claim 1.

[0015] In the received-data display-control approach of the communication terminal which displays the data received with the data receiving means on a display means, invention of claim 7 is characterized by displaying said alphabetic data and said image data on coincidence to said display means based on said analysis result while it carries out judgment discernment of alphabetic data and the image data by analyzing said received data.

[0016] Invention of claim 8 is characterized by setting up the character representation section and the image display section beforehand on a display screen, and a display means displaying said alphabetic data and image data on the display which corresponds respectively in invention of claim 7.

[0017] Invention of claim 9 is characterized by switching to the display screen which displays only said alphabetic data to said character representation section and said image display section based on predetermined character representation actuation during the coincidence display of alphabetic data and image data in invention of claim 8.

[0018] Invention of claim 10 is characterized by switching said alphabetic data to the display screen which indicates by scrolling based on predetermined scrolling display actuation during the coincidence display of alphabetic data and image data in invention of claims 8 or 9.

[0019] Invention of claim 11 is characterized by performing judgment discernment of said alphabetic data and said image data based on the data identifier contained in received data in invention of claim 7.

[0020]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to a detail with reference to an accompanying drawing. Drawing 1 is drawing showing the outline configuration of PHS which is 1 operation gestalt of the migration communication system concerning this invention. That is, two or more PHS base stations CS1-CSm are distributed by the service area, and the 100-500-meter wireless zones Z1-Zm are formed for a radius of these PHS base stations CS1-CSm, respectively. The PHS base stations CS1-CSm are connected to

the PHS contact PM which has I' interface function prepared in the integrated services digital network (it is hereafter called ISDN for short) INW, respectively.

[0021] In addition, drawing 1 shows the configuration which distributed the PHS base stations CS1-CSm so that a wireless zone may not lap mutually, but a PHS base station may carry out multiplex arrangement so that wireless zones may overlap mutually on the same service area.

[0022] Within the wireless zone Z1 which the above-mentioned PHS base stations CS1-CSm form - Zm, it connects with the PHS base stations CS1-CSm alternatively through a radio channel, and each mobile stations PS1-PSn are connected to the wire telephone machine TEL 1 - TELk through Above ISDN, or this ISDN and subscriber's network SNW from these PHS base stations CS1-CSm. Moreover, the direct communication a mobile station PS 1 - between PSn(s) is also possible by carrying out connection control in the PHS base stations CS1-CSm.

[0023] In addition, as an access method between the PHS base stations CS1-CSm and mobile stations PS1-PSn, a time division multiple access (TDMA;Time Division Multiple Access) method is adopted, and the time-sharing bidirectional multiplex (TDD;Time Division Duplex) method is adopted as a transmission system.

[0024] Moreover, PHS is equipped with the control center CC with a database, a customer information management database, etc. The information concerning the above-mentioned mobile stations PS1-PSn and the PHS base stations CS1-CSm is collected through ISDN and the packet network PNW, and service management and control of authentication, accounting, a network control, etc. are performed in this control center CC based on this information.

[0025] On the other hand, the above-mentioned mobile stations PS1-PSn (a sign 100 shows for convenience) are constituted as follows. Drawing 2 is the circuit block diagram showing the configuration.

[0026] This PHS mobile station 100 is equipped with the wireless section 1 equipped with the antenna 11, the modem section 2, the TDMA section 3, the message section 4, a control section 5, the information storage section 6, the data communication section 7, and the DTMF (dual tone multi-frequency) receiver 8. Furthermore, the key input section 51, a display 52, a sounder 53, and the vibrator unit 54 are formed as a thing attached to a control section 5.

[0027] this -- PHS -- a mobile station -- 100 -- setting -- a base station -- CS -- one - CSm -- from -- having come -- wireless -- a carrier signal -- an antenna -- 11 -- receiving -- having had -- after -- wireless -- the section -- one -- high frequency -- a switch -- (-- SW - -) -- 12 -- minding -- a receive section -- 13 -- inputting -- having . In this receive section 13, the radio frequency signal by which reception was carried out [above-mentioned] is mixed with the local oscillation signal generated from the frequency synthesizer 14, and a down convert is carried out at a received intermediate frequency signal. In addition, the local oscillation signal frequency generated from the above-mentioned frequency synthesizer 14 is directed to the value corresponding to a radio-channel frequency from a control section 5. Moreover, the received field strength detecting element (RSSI) 16 is formed in the wireless section 1. In this received field strength detecting element 16, the received field strength of the wireless carrier signal which came from the PHS base stations CS1-CSm is detected, and that detection value is notified to a control section 5, in order to perform a judgment and display of for example, receiving quality.

[0028] The received intermediate frequency signal outputted from the above-mentioned receive section 13 is inputted into the recovery section 21 of the modem section 2. In the recovery section 21, the digital recovery of the above-mentioned received intermediate frequency signal is performed, and, thereby, a digital recovery signal is reproduced.

[0029] The TDMA decoding section 31 of the TDMA section 3 separates the above-mentioned digital recovery signal for every receiving time slot. And if the data of the separated slot are voice data, this voice data will be inputted into the message section 4. On the other hand, these data will be inputted into the data communication section 7 if the data of the separated slot are non-restricting digital data and control data.

[0030] The message section 4 is equipped with the ADPCM (Adaptive Differential Pulse Code Modulation; adaptive differential PCM) transformer coder 41, the PCM codec 42, the mode change-over switch 43, the loudspeaker 44, and the microphone 45. The ADPCM transformer

coder 41 decodes the voice data outputted from the above-mentioned TDMA decoding section 31. The PCM codec 42 changes into an analog signal the digitized voice signal outputted from the above-mentioned ADPCM transformer coder 41, and outputs it to the mode change-over switch 43.

[0031] Change-over control of the mode change-over switch 43 is carried out by voice talk mode or messaging mode at the loudspeaker 44 and DTMF receiver 8 side. The sound-reinforcement output of the analog sound signal from the PCM codec 42 is carried out from a loudspeaker 44 through the mode change-over switch 43 at the time of voice talk mode. Moreover, the sound signal (DTMF signal) outputted from the PCM codec 42 is inputted into the DTMF receiver 8 through the mode change-over switch 43 at the time of messaging mode.

[0032] The data communication section 7 receives the data supplied from the above-mentioned TDMA decoding section 31, and supplies this data to a control section 5. Moreover, this data communication section 7 controls data transmission and reception using the communication procedure of Pias (Phs Internet Access Forum Standard) adopted with PHS. As mentioned later, this data communication section 7 is a function part which transmits and receives mail data with image data with this operation gestalt.

[0033] The DTMF receiver 8 does reception of the DTMF signal changed into the sound signal by the PCM codec 42. In this operation gestalt, reception of the message information to which the image information which consists of this DTMF signal is not attached is performed with the DTMF receiver 8.

[0034] A control section 5 is what was equipped with the microcomputer as the main control section, and has the control means for bearing the usual functions, such as a radio-channel access-control means, a sending-and-receiving control means, a message control means, and a dc-battery saving control means, at least.

[0035] As one of the control which this control means bears, there is control based on the data supplied from the data communication section 7. That is, if the received data from the data communication section 7 are control data, a control section 5 will analyze this control data, and will perform required control. On the other hand, if received data are information data which came from the server etc., while memorizing this information data in the information storage section 6, it is made to supply and display on a display 52.

[0036] Moreover, a control section 5 judges any shall set up between voice talk mode or messaging mode according to actuation of the key for mode setting of the key input section 51, and performs change-over control of the above-mentioned mode change-over switch 43 according to this decision result.

[0037] The information storage section 6 memorizes the receipt information data from the server mentioned above besides a program of operation or the telephone number, and various information (mail data etc.), such as message information.

[0038] On the other hand, after PCM coding is carried out by the PCM codec 42, compression coding of a user's sound signal inputted from the microphone 45 is further carried out in the ADPCM transformer coder 41. And this coding voice data is inputted into the TDMA encoding section 32. Moreover, control data and information data which were outputted from the control section 5 are inputted into the above-mentioned TDMA encoding section 32 through the data communication section 7.

[0039] The digitized voice data of each channel outputted from the above-mentioned ADPCM transformer coder 41, and the control data outputted from the data communication section 7 and information data (mail data etc.) are inserted in the transmitting time slot to which it was directed from the control section 5, and the TDMA encoding section 32 multiplexes them. The modulation section 22 carries out the digital modulation of the transmitted intermediate frequency signal with the multiplexing digital-communication signal outputted from the above-mentioned TDMA encoding section 32, and inputs this modulated transmitted intermediate frequency signal into the transmitting section 15.

[0040] The transmitting section 15 mixes the transmitted intermediate frequency signal by which the modulation was carried out [above-mentioned] with the local oscillation signal generated from the frequency synthesizer 14, carries out a rise convert at wireless carrier frequency, and

is amplified to further predetermined transmitted power level. The wireless carrier signal outputted from this transmitting section 15 is transmitted towards the PHS base stations CS1-CSm through the high frequency switch 12 from an antenna 11.

[0041] Among what is been [what / it] attached and prepared in a control section 5, the key input section 51 has two or more keys, and inputs various information required for motion control etc. A display 52 consists of a liquid crystal display (LCD), and displays the various information concerning input, the above-mentioned motion control, etc. from the above-mentioned key input section 51. A sounder 53 reports a ringer tone, and also is used as a means which carries out the playback output of the melody. The vibrator unit 54 reports arrival of the mail etc. by vibration.

[0042] In the PHS mobile station 100 concerning this operation gestalt, the control section 5 possesses the e-mail transmit/receive control section 501 besides the control means which bears the usual function mentioned above, the reception mail analysis section 502, and the screen-display control section 503.

[0043] The e-mail transmit/receive control section 501 performs control for transmitting and receiving mail data among the phase hands of arbitration. In this operation gestalt, the e-mail transmit/receive control section 501 can respond also to transmission and reception of the mail data which consists of alphabetic data and image data, and can respond to the control which attaches, transmits and receives melody data to mail data.

[0044] The reception mail analysis section 502 analyzes the mail data received by control of the e-mail transmit/receive control section 501, and carries out judgment discernment of alphabetic data and the image data.

[0045] The screen-display control section 503 performs control which displays receiving mail data on a display 52 based on the analysis result of the received-data analysis section 502. In the gestalt of this operation, the screen-display control section 503 is controlled to display at coincidence the alphabetic data in which judgment discernment was carried out by the reception mail analysis section 502 out of receiving mail data, and image data on the display area where it corresponds on a display 52, respectively.

[0046] Drawing 3 is drawing showing the outline configuration of the display 52 concerning this operation gestalt. As shown also in this drawing, the PICT section 522 as which this display 52 displays the condition of the mobile station 100 concerned on the topmost part of the liquid crystal display screen 521 is formed. Moreover, the image display section 523 for displaying an image on the lower part of the PICT section 522 is formed, and the character representation section 524 for displaying an alphabetic character is formed in the bottom.

[0047] The screen-display control section 503 reads receiving mail data from the information storage section 6, identifies alphabetic data and image data based on the analysis result of this receiving mail data based on the reception mail analysis section 502, and performs control which carries out bitmapped image conversion and displays these alphabetic data and image data to each viewing area 524, i.e., the character representation section, and the image display section 523.

[0048] Thereby, when a message with image data is received, the images (illustration etc.) relevant to an alphabetic character message and this can be expressed as this operation gestalt on a display 52 at coincidence.

[0049] Next, reception actuation of the mail data which is the object of the display control by the above-mentioned screen-display control section 503 is explained. Here, for example in the system shown in drawing 1, the case where mail data (it consists of alphabetic data and image data) is transmitted to the PHS mobile station PS 3 from the PHS mobile station PS 1 is considered.

[0050] In this case, in the transmitting-side mobile station PS 1, after creating or choosing first the alphabetic character message and image which it is going to send, respectively, submission operation to the receiving-side mobile station PS 3 is performed.

[0051] The dispatch processing by the e-mail transmit/receive control section 501 of the transmitting-side mobile station PS 1 is started by this submission operation, and a predetermined call offering procedure is performed by it through the PHS contact PM in the

PHS base stations [CS and INW] 1 (ISDN), and the PHS base station CS 2 between the e-mail transmit/receive control sections 501 of the receiving-side mobile station PS 3. And the transmitting-side mobile station PS 1 and the receiving-side mobile station PS 3 shift to a talk state with this call offering procedure.

[0052] Then, the transmitting-side mobile station PS 1 starts transmission of message information by predetermined message-sending actuation. Setting to this send action, the e-mail transmit/receive control section 501 reads the alphabetic data and the image data corresponding to the alphabetic character message and image which are created or chosen by the actuation till then from the information storage section 6, and transmits towards the PHS base station CS 1 which is a jurisdiction station through the data communication section 7, the TDMA section 3, the modem section 2, and the wireless section 1.

[0053] Drawing 4 shows an example of the data transmitting format at this time. especially — this drawing — “Merry Christmas — Christmas pleasant today. Unless it sleeps early, it does not those[with a present]-**”. It is an example in the case of sending the illustration [this drawing (a)] relevant to the alphabetic character message and this “”; as mail data.

[0054] In the send action of the transmitting-side mobile station PS 1 mentioned above, the alphabetic data and the image data corresponding to these alphabetic character message and an illustration are the data communication section 7, and it is assembled by the signal as shown in this drawing (b), and is inputted into the TDMA section 3. That is, this signal consists of an “alphabetic data identifier”, the “contents of alphabetic data”, an “image data identifier”, and the “contents of image data”, and the alphabetic data and the image data corresponding to the alphabetic character message and image in this drawing (a) are inserted in the parts of the “contents of alphabetic data” of these, and the “contents of image data”, respectively.

[0055] Subsequently, in the TDMA section 3, by the TDMA encoding section 32, it inserts all over the information field (I) in the transmitting time slot [this drawing (c)] to the receiving-side mobile station PS 3 to which the above-mentioned signal [this drawing (b)] outputted from the data communication section 7 was directed from the control section 5, and processing which multiplexes is performed.

[0056] In the base station CS 1 which received the message information transmitted from the transmitting-side mobile station PS 1 by this processing, this received message information is sent to the PHS base station CS 2 which is a jurisdiction station of the receiving-side mobile station PS 3 through INW, and the PHS base station CS 2 transmits this message information to the receiving-side mobile station PS 3 further.

[0057] On the other hand, in the receiving-side mobile station PS 3, after an antenna 1 receives the message information transmitted from the PHS base station CS 2, it inputs into the data communication section 7 through the wireless section 1, the modem section 2, and the TDMA section 3.

[0058] Inputting into the e-mail transmit/receive control section 501 the message information received in the PHS procedure in this data communication section 7, the reception mail analysis section 502 analyzes the message information inputted into the e-mail transmit/receive control section 501, and performs message reception which extracts only required data from the received message information concerned which changes by format as shown in drawing 4, and is memorized in the information storage section 6.

[0059] Thus, it consists of PHS mobile stations 100 of this operation gestalt so that it may receive in a format as shows the message information (mail data) which consists of alphabetic data and image data to drawing 4 (b).

[0060] Next, the analysis and the display control of the receiving mail data in the PHS mobile station 100 concerning this operation gestalt are explained with reference to the flow chart shown in drawing 5.

[0061] In this PHS mobile station 100, after performing reception of the mail data which changes by format as shown in drawing 4 (b), it waits for the predetermined display confirmation operation in the key input section 51, this receiving mail data is analyzed by the reception mail analysis section 502, and it judges whether an image (illustration) is contained in the receiving mail data concerned (step 501). In addition, this decision processing can be performed with

reference to the alphabetic data identifier and image data identifier [refer to drawing 4 R> 4 (b)] which are contained in receiving mail data.

[0062] When the image is contained (step 501 YES), the screen-display control section 503 reads the alphabetic data and the image data which constitute the receiving mail data concerned from the information storage section 6, makes it display on the character representation section 524 of the liquid crystal display screen 521 about alphabetic data (step 502), and makes it display on the image display section 523 about image data here (step 503).

[0063] In addition, on the occasion of this display control, the screen-display control section 503 performs processing which changes these alphabetic data and image data into a bitmapped image, respectively, and is outputted to a display 52 so that bit map expansion of alphabetic data and the image data may be carried out in the location corresponding to the above-mentioned character representation section 524 and the image display section 523, respectively.

[0064] Then, the screen-display control section 503 supervises whether check termination directions were made by the predetermined key stroke in the key input section 51 (step 504). here, directions of check termination should do -- when there is nothing (step 504 NO) next, it supervises whether directions for the predetermined key stroke in the key input section 51 to perform character representation were made (step 505).

[0065] And when there are directions of character representation (step 505 YES), only the alphabetic data of the data which constitute receiving mail data is read from the information storage section 6, this alphabetic data is displayed using both the character representation section 524 and the image display section 523 (step 506), and it returns to step 504 after that.

[0066] In addition, on the occasion of this display control, the screen-display control section 503 performs processing which changes the alphabetic data concerned into a bitmapped image, and is outputted to a display 52 so that bit map expansion of the alphabetic data may be carried out in the location corresponding to the whole region of the above-mentioned character representation section 524 and the image display section 523.

[0067] moreover, directions of character representation should do in step 505 -- when there is nothing (step 505 NO) next, it supervises whether the screen-display control section 503 had directions of a scrolling display by the predetermined key stroke in the key input section 51 (step 507).

[0068] Here, if there are no scrolling directions (step 507 NO), it will return to step 504 and an alphabetic character and an image coincidence display will be continued. On the other hand, when scrolling display directions are during an alphabetic character and an image coincidence display (step 507 YES), the screen-display control section 503 scrolls and displays alphabetic data on the character representation section 524 (step 508).

[0069] On the occasion of this display control, the screen-display control section 503 performs processing which reads from the information storage section 6, changes the alphabetic data concerned into a bitmapped image one after another, and is outputted to a display 52 so that alphabetic data may move in the form where scrolling was balanced on the location corresponding to the above-mentioned character representation section 524.

[0070] In addition, in step 501, when receiving mail data does not contain an image (step 501 NO), the screen-display control section 503 reads the alphabetic data which constitutes the receiving mail data concerned from the information storage section 6, and displays this alphabetic data on a display 52 like the case in step 506 (step 510). In this display control, the screen-display control section 503 performs processing which changes the alphabetic data concerned into a bitmapped image, and is outputted to a display 52 so that bit map expansion of the alphabetic data may be carried out in the location corresponding to the whole region of the above-mentioned character representation section 524 and the image display section 523.

[0071] While performing the alphabetic character and image coincidence display (step 502,503) based on alphabetic data and image data, the display (step 506) of only an alphabetic character, and the alphabetic character scrolling display (step 508) like ****, by what directions of check termination are received for (step 504 YES), the screen-display control section 503 switches off the liquid crystal display screen 521, and ends a display control.

[0072] Next, the example of the reception mail display confirmation operation procedure in the

PHS mobile station 100 concerning this operation gestalt is explained with reference to drawing 6.

[0073] In this PHS mobile station 100, after performing reception of mail data like ****, it awaits, goes into the mode and shifts to intermittent reception actuation. At this time, it awaits on the liquid crystal display screen 521, and a screen (Screen 1) is displayed (step 601).

[0074] In addition, a control section 5 reports that there was e-mail arrival to a user by driving a sounder 53, and performing e-mail ringer tone singing, performing an e-mail arrival display to a display 52, or performing this ringer tone singing and an e-mail arrival display to coincidence at the time of reception of mail data. As an example of this e-mail arrival display, the e-mail reception information mark (graphic form which imitated the envelope) is displayed on the PICT section 522 in the above-mentioned screen 1.

[0075] During the display of Screen 1, if a user inputs “#” and “1” from the key input section 51, when the screen-display control section 503 decodes this key input, Screen 1 on the liquid crystal display screen 521 will be switched and displayed on an e-mail actuation screen (Screen 2) (step 602).

[0076] During the display of Screen 2, if “1” is inputted from the key input section 51 that a “received message” should be chosen from the “received messages”, “transmission”, and “transmitting sentence registration” which are displayed as a candidate for actuation, when the screen-display control section 503 decodes this key input, it will be confirmed whether there is any receiving mail data or there is nothing.

[0077] Here, when there is no reception mail, the screen-display control section 503 switches Screen 2 on the liquid crystal display screen 521 to Screen 3 (step 603), and after indicating the purport (“there is no receiving sentence”) in which receiving mail data does not exist by predetermined time, it returns to the condition of displaying Screen 2 (step 602).

[0078] When “1” is inputted that a “received message” should be chosen while displaying Screen 2 and there is receiving mail data on the other hand, the screen-display control section 503 is switched and displayed on the received message actuation screen (Screen 4) which asks actuation classification of as opposed to this receiving mail data for Screen 2 on the liquid crystal display screen 521 (step 604).

[0079] If “an all clearance” is chosen by carrying out the depression of the right translation cursor key “->” as opposed to the guidance display which asks whether receiving mail data “is checked [or]” during the display of Screen 4, and whether “an all clearance” is carried out, when the screen-display control section 503 decodes this key input as all clear directions, Screen 4 on the liquid crystal display screen 521 will be switched and displayed on a memory clear screen (Screen 5) (step 605).

[0080] The screen-display control section 503 performs the guidance display which tells that (“inside of memory all clear”) to this screen 5 according to processing of an all clearance of receiving mail data being made by the control section 5 based on the above-mentioned all clear directions. And in connection with all clear processing of the receiving mail data in a control section 5 being completed, Screen 5 is switched and displayed on Screen 1.

[0081] On the other hand, while displaying Screen 4, if “a check” is chosen by carrying out the depression for example, of the left translation cursor key “<-”, when the screen-display control section 503 decodes this key input as check directions, Screen 4 on the liquid crystal display screen 521 will be switched to a reception mail check screen (Screen 6), and will be displayed (step 606).

[0082] In the display control to this screen 5, after the screen-display control section 503 reads receiving mail data from the information storage section 6, it changes these data into a bitmapped image, respectively, and transmits the data of 1 screen sentence to a display 52 so that alphabetic data and image data are identified based on the analysis result of the receiving mail data concerned based on the reception mail analysis section 502, alphabetic data may be displayed on the character representation section 524 and image data may be displayed on the image display section 523, respectively. By this, on Screen 6, an image (part described as “an illustration display”) and an alphabetic character (“Merry Christmas”) will be displayed by coincidence.

[0083] If for example, the "*" key is pressed in the display of Screen 6, and on the key input section 51, when the screen-display control section 503 decodes this key input as scrolling directions, Screen 6 on the liquid crystal display screen 521 will be switched and displayed on a scrolling screen (Screen 7) (step 607).

[0084] In the display control to this screen 7, the screen-display control section 503 reads only the alphabetic data in the receiving mail data memorized by the information storage section 6 one after another, it is carrying out sequential conversion and transmitting the alphabetic data concerned to a bitmapped image at a display 52 so that scrolling may become possible on the character representation section 524 of the bottom of the liquid crystal display screen 521, and it realizes an alphabetic character scrolling display.

[0085] In addition, when it is related with the alphabetic character scrolling display to this screen 7 and finishes indicating after the bottom of an on display above-mentioned [of Screen 6] "*" key press, and the inside of the character representation section 524 by scrolling to the last alphabetic character, or when it has been recognized that "OFF" key was pushed on during this period, there is the approach of controlling to stop the scrolling concerned. Moreover, after the scrolling halt concerned, when the "*" key is pressed, how to control to resume scrolling from the halt location again is also considered.

[0086] On the other hand, if a "message" key is pressed in the display of Screen 6, or the display (under an alphabetic character scrolling display in Screen 7 is included) of Screen 7, and on the key input section 51, when the screen-display control section 503 decodes the key input at this time as character representation directions, Screen 6 or Screen 7 on the liquid crystal display screen 521 will be switched and displayed on the display screen only for alphabetic characters (Screen 8) (step 608). In addition, when a "message" key is pressed during the alphabetic character scrolling display in Screen 7, the scrolling display is suspended immediately and it switches to the display screen 8 only for alphabetic characters.

[0087] In the display control to this screen 8, after reading the alphabetic data in the receiving mail data memorized by the information storage section 6, the screen-display control section 503 changes the alphabetic data concerned into a bitmapped image, transmits it to a display 52 so that this alphabetic data may cross throughout the image display section 523 on the liquid crystal display screen 521, and the character representation section 524 and may be displayed, and is controlled to display this alphabetic data throughout the above. In addition, it may be made to perform an alphabetic character scrolling display by pressing the "*" key like under the display of Screen 7, while displaying Screen 8.

[0088] If the depression of the "CLR" key is carried out on the key input section 51 by finishing checking all descriptions during the display of Screen 8 etc., when the screen-display control section 503 decodes the key input at this time as check termination directions, Screen 8 on the liquid crystal display screen 521 will be awaited, and it will switch and display on Screen 1 at the time (step 601).

[0089] By same control, also while displaying Screen 2, Screen 4, Screen 6, and Screen 7, by carrying out the depression of the "CLR" key, the screen on the liquid crystal display screen 521 can be awaited, it can switch to Screen 1 at the time, and receiving mail data display check processing can be ended.

[0090] In addition, although the above-mentioned example described the case where that in which alphabetic data and image data are intermingled as mail data was sent, it is also possible to attach and send a melody to these mail data further in the PHS mobile station 100 concerning this invention.

[0091] For example, in the system shown in drawing 1, when transmitting mail data with a melody to a mobile station PS 3 from a mobile station PS 1, it can be coped with telling the purport of transmission from the user of the transmitting-side mobile station PS 1 during both message, and demanding reception actuation from the user of the receiving-side mobile station PS 3, or by setting auto-answer mode as the receiving-side mobile station PS 3, and carrying out transmitting initiation from the transmitting-side mobile station PS 1 to desired timing.

[0092] In addition, although it cannot be overemphasized that the transmit/receive control of mail data itself can be performed by the approach mentioned above, in transmission and

reception of this mail data with a melody, it can transmit and receive like [data / which are attached to this mail data / melody] the mail data concerned. Namely, what is necessary is to transmit in a format as shows the melody data attached to mail data to drawing 4 (b), and just to make it the transmitting-side mobile station PS 1 receive this melody data with the receiving-side mobile station PS 3 in this case.

[0093] In addition, in the above-mentioned example, although indicated only about the actuation on the mobile network of PHS, the alphabetic character and image coincidence display control based on receiving mail data are realizable [with the same control] also about other classes and migration communication terminals of migration communication system.

[0094] Moreover, in this operation gestalt, although explained as what transmits and receives mail data with image data using a Piafs procedure, it is also possible for it not to be limited to this but to consider as the gestalt transmitted and received, using the DTMF receiver 8 as other operation gestalten, for example.

[0095] That is, it constitutes so that mail data with image data may be received as a DTMF signal, and with the DTMF receiver 8, reception of the mail data with image data which consists of this DTMF signal is performed. And mail data with image data is changed into a DTMF signal, and this DTMF signal is inputted into the DTMF receiver 8 through the mode change-over switch 43. Furthermore, with the DTMF receiver 8, reception of this DTMF signal is carried out, and it is inputted into the e-mail transmit/receive control section 501. Furthermore, the reception mail analysis section 502 will analyze the mail data with image data received based on the input from the DTMF receiver 8.

[0096] In this operation gestalt, although PHS was mentioned as the example and explained, it is not limited to PHS but can apply to the mobile radio machine whole containing the selective-calling receiver which can transmit and receive mail data with image data. The class of radio method in a selective-calling receiver and a mobile radio machine is not asked, either.

[0097] Moreover, a screen-display gestalt and operating procedure are not limited to this operation gestalt.

[0098]

[Effect of the Invention] Since according to this invention judgment discernment of alphabetic data and the image data is carried out from received data and alphabetic data and image data were displayed on coincidence to the display means as explained above, an alphabetic character message and an image can be checked on the same screen, and improvement in the designation nature of received data can be aimed at. Moreover, thereby, in order to check both an alphabetic character message and an image, the need of performing special change-over actuation is lost, and an operability fall can also be prevented.

[0099] Moreover, according to this invention, the character representation section and the image display section are set up on the display screen of a display means, and since he is trying to display alphabetic data and image data on the display which corresponds respectively, a check with an alphabetic character message and an image becomes easy.

[0100] Moreover, according to this invention, during the coincidence display of alphabetic data and image data, since he is trying to display only alphabetic data using the character representation section and the image display section based on predetermined character representation actuation, also when there is much alphabetic character amount of data, an alphabetic character message can be recognized collectively.

[0101] Moreover, according to this invention, during the coincidence display of alphabetic data and image data, in order to indicate the alphabetic data by scrolling based on predetermined scrolling display actuation, all the contents of the alphabetic character message can be checked, displaying an image to the viewing area of the character representation section, even when there is much alphabetic character amount of data.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The system configuration Fig. of PHS concerning this invention.

[Drawing 2] The block diagram showing the configuration of the PHS mobile station in drawing 1 .

[Drawing 3] Drawing showing the outline configuration of the display in a PHS mobile station.

[Drawing 4] Drawing showing an example of the data transmitting format in a PHS mobile station.

[Drawing 5] The flow chart which shows the reception mail analysis display-control actuation in a PHS mobile station.

[Drawing 6] Drawing showing the reception mail display confirmation operation procedure in a PHS mobile station.

[Description of Notations]

100 PHS (Personal Handyphone System) Mobile Station

1 Wireless Section

11 Antenna

12 High Frequency Switch (SW)

13 Receive Section

14 Frequency Synthesizer

15 Transmitting Section

16 Received Field Strength Detecting Element (RSSI)

2 Modem Section

21 Recovery Section

22 Modulation Section

3 The TDMA (Time Division Multiple Access) Section

31 TDMA Decoding Section

32 TDMA Encoding Section

4 Message Section

41 ADPCM (Adaptive Differential Pulse Code Modulation) Transformer Coder

42 PCM Codec

43 Mode Change-over Switch

43 Loudspeaker

44 Microphone

5 Control Section

501 E-mail Transmit/receive Control Section

502 Received-Data Analysis Section

503 Screen-Display Control Section

6 Information Storage Section

7 Data Communication Section

8 DTMF (Dual Tone Multi-Frequency) Receiver

51 Key Input Section

52 Display

521 Liquid Crystal Display Screen
522 PICT Section
523 Image Display Section
524 Character Representation Section
53 Sounder
54 Vibrator Unit
TEL1 – TELk Wire telephone machine
SNW Subscriber's network
INW ISDN (integrated services digital network)
PM PHS contact
PNW Packet network
CC Control center
CS1-CSm PHS base station
PS1-PSn PHS mobile station
Z1-Zm Wireless zone

[Translation done.]

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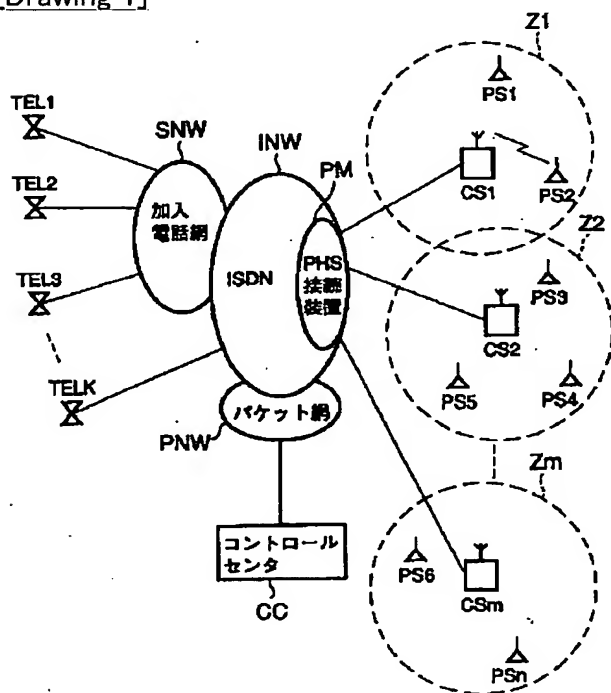
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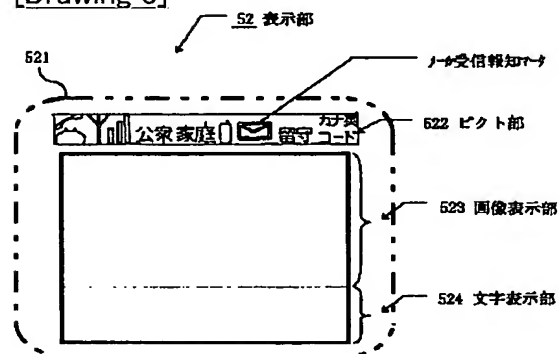
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DRAWINGS

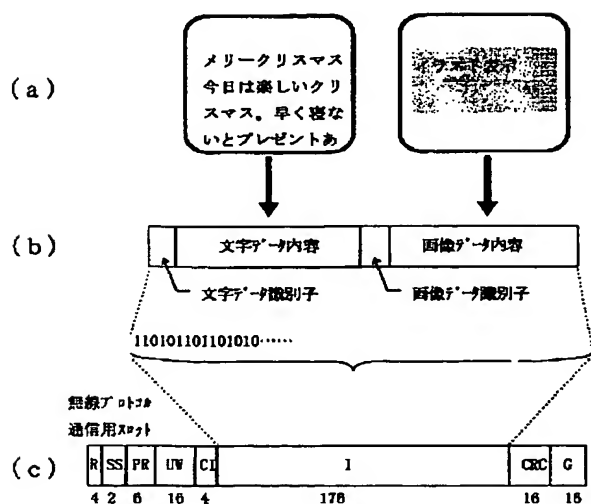
[Drawing 1]



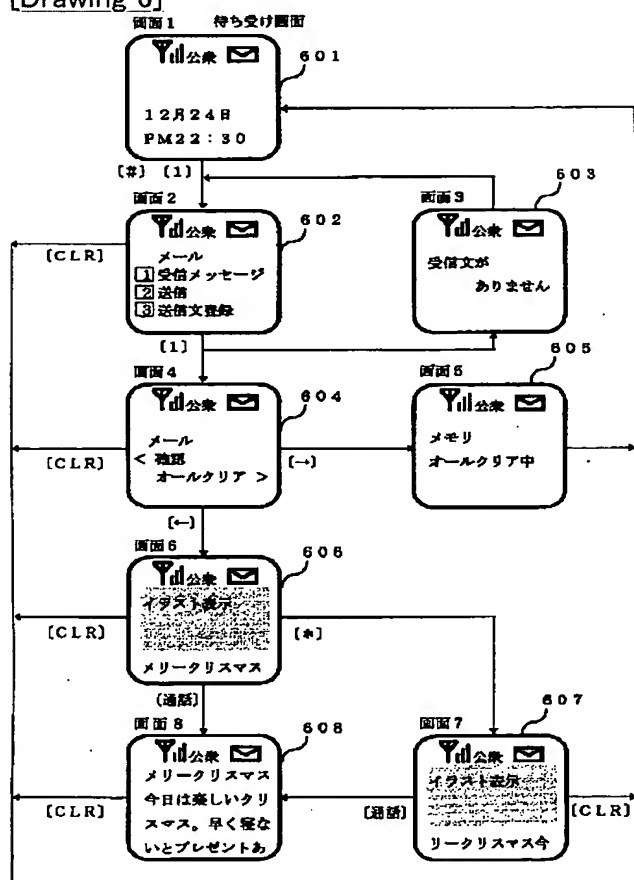
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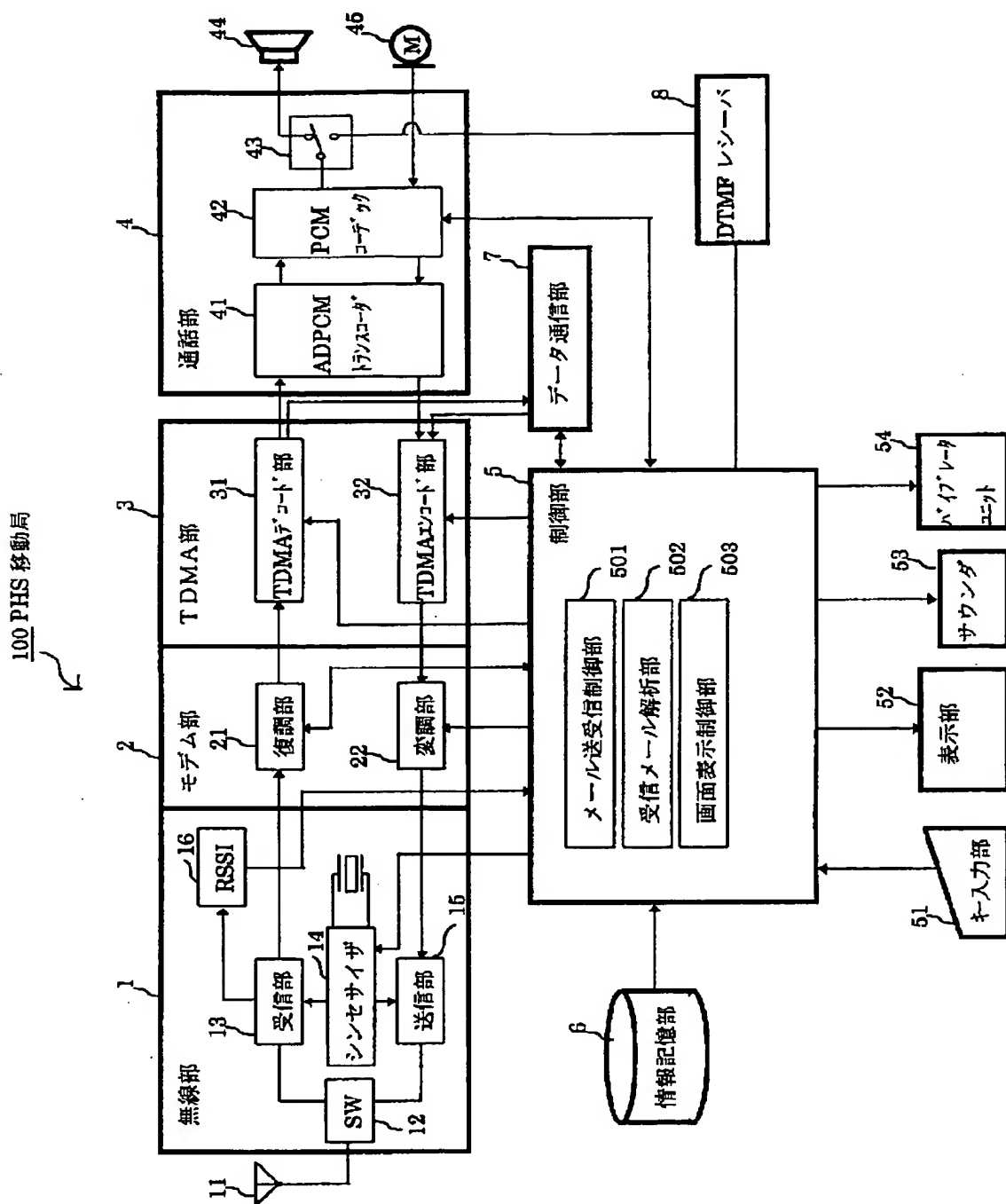
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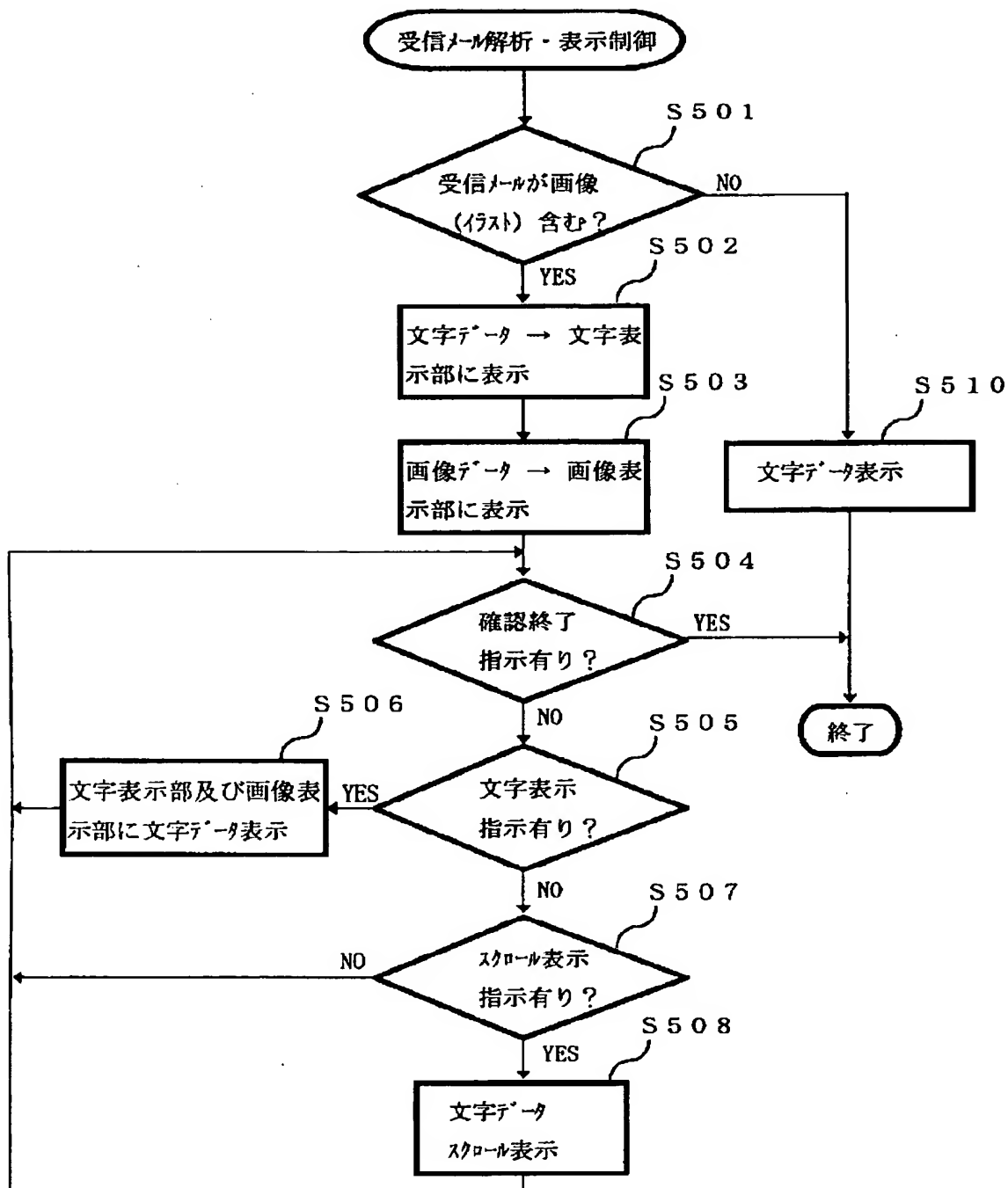
[Drawing 6]



[Drawing 2]



[Drawing 5]



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